

University of Groningen

Exercise induced bronchoconstriction in childhood asthma

van Leeuwen, Janneke

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:

2015

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

van Leeuwen, J. (2015). *Exercise induced bronchoconstriction in childhood asthma: development, diagnostics and clinical features*. [Thesis fully internal (DIV), University of Groningen]. [S.n.].

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Exercise induced bronchoconstriction in childhood asthma

Development, diagnostics and clinical features

Janneke van Leeuwen

This thesis was supported by Stichting Pediatrisch Onderzoek Enschede

The printing of this thesis was financially supported by:

AbbVie, ALK Abelló, Chiesi Pharmaceuticals, GlaxoSmithKline, Mead Johnson Nutrition, Medical School Twente, Rijksuniversiteit Groningen, Stichting AstmaBestrijding, TEVA Nederland, Universitair Medisch Centrum Groningen, Lide Jannink Stichting namens het KNMG-district Twente

Copyright © 2015 J.C. van Leeuwen, the Netherlands

ISBN: 978-94-6169-609-0

Cover: Deep Breath ©Melanie Weidner

Layout and print: Optima Grafische Communicatie, Rotterdam, The Netherlands



rijksuniversiteit
 groningen

Exercise induced bronchoconstriction in childhood asthma

Development, diagnostics and clinical features

Proefschrift

ter verkrijging van de graad van doctor aan de
 Rijksuniversiteit Groningen
 op gezag van de
 rector magnificus prof. dr. E. Sterken
 en volgens besluit van het College voor Promoties.

De openbare verdediging zal plaatsvinden op

woensdag 18 februari 2015 om 14.30 uur

door

Janneke Carolien van Leeuwen

geboren op 9 februari 1984
 te Oude Pekela

Promotor

Prof. dr. E.J. Duiverman

Copromotores

Dr. B.J. Thio

Dr. M.G.R. Hendrix

Beoordelingscommissie

Prof. dr. P.L.P. Brand

Prof. dr. G.H. Koppelman

Prof. dr. E. Dompeling

TABLE OF CONTENTS

Chapter 1	General introduction and outline of the thesis	7
Chapter 2	Equal virulence of rhinovirus and respiratory syncytial virus in infants hospitalised with lower respiratory tract infection	21
Chapter 3	Dynamics of viral load and symptoms in infants hospitalised with respiratory syncytial virus or rhinovirus lower respiratory tract infection	31
Chapter 4	Monitoring pulmonary function during exercise in children with asthma	43
Chapter 5	Measuring breakthrough exercise induced bronchoconstriction in young asthmatic children using a jumping castle	57
Chapter 6	Exercise induced bronchoconstriction in 5 to 7 year old children after hospitalisation for lower respiratory tract infection by rhinovirus or respiratory syncytial virus in infancy	73
Chapter 7	Effects of dietary induced weight loss on exercise induced bronchoconstriction in overweight and obese children	87
Chapter 8	Assessment of exercise induced bronchoconstriction in adolescents and young children	101
Chapter 9	Summary and general discussion	119
	Nederlandse samenvatting	131
	Dankwoord	143
	Publications	149
	Curriculum Vitae	153

